

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

Claims 1-35 (Cancelled).

36. (New) A nanoengineered structure, comprising:
a crystalline semiconductor nanowhisker of a first conductivity type; and
an enclosure comprising a bulk semiconductor region of a second conductivity type
opposite to the first conductivity type enclosing and in contact with said nanowhisker along at
least part of its length;

wherein a combination of the nanowhisker and the bulk semiconductor region forms a
pn junction.

37. (New) The structure of claim 36, wherein the nanowhisker is intrinsically first
conductivity type.

38. (New) The structure of claim 37, further comprising a semiconductor substrate
of the first conductivity type, wherein the nanowhisker is upstanding from the substrate.

39. (New) The structure of claim 36, wherein:
the nanowhisker comprises a one-dimensional nanoelement of a first crystalline III-V
semiconductor material having a first bandgap;
the enclosure comprises at least one second semiconductor bulk material having a
second bandgap different from the first band gap; and
the bandgaps of the nanoelement and the enclosure are such that it is energetically
favorable for charge carriers to remain in said nanoelement.

40. (New) The structure of claim 36, wherein said enclosure comprises a
semiconductor material deposited on the sides of said nanoelement.

41. (New) A method of forming a pn junction in a structure comprising a one-dimensional nanoelement, the method comprising:

forming a crystalline semiconductor one dimensional nanoelement comprising a nanowhisker of a first conductivity type upstanding from a substrate; and

forming an enclosure comprising a bulk semiconductor region of a second conductivity type opposite to the first conductivity type enclosing and in contact with said nanowhisker along at least part of its length;

wherein a combination of the nanowhisker and the bulk semiconductor region forms a pn junction.

42. (New) The method of claim 41, wherein the nanowhisker is intrinsically first conductivity type.

43. (New) The method of claim 42, wherein the substrate comprises a semiconductor substrate of the first conductivity type.

44. (New) The method of claim 41, wherein:
the nanowhisker comprises a first crystalline III-V semiconductor material having a first bandgap;

the enclosure comprises at least one second semiconductor bulk material having a second bandgap different from the first band gap; and

the bandgaps of the nanoelement and the enclosure are such that it is energetically favorable for charge carriers to remain in said nanoelement.

45. (New) The method of claim 41, wherein the step of forming said enclosure comprises growing a semiconductor material on sides of said nanoelement using bulk material growth conditions.